

Clock, Fall: A Performative Lecture on Choreorobotics

-- Sydney Skybetter (BROWN UNIVERSITY)

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"Clock, Fall" was written as a performative keynote and presented at the Mahindra Humanities Center at Harvard University. The talk is about *choreorobotics*, a portmanteau of choreography and robotics, and a field which Skybetter has pioneered at the interdisciplinary intersection of choreographic theory and robotic motion planning. Choreorobotics offers a rich, critical aperture to consider how bodies in motion—human or otherwise—move through space and time to generate meaning. In "Clock, Fall", Skybetter dives into the origin of choreorobotics, recent advancements in the field, and how emerging technologies can be informed or disrupted by collective action and coalition building, drawing from his work as the founder of the Conference for Research on Choreographic Interfaces and podcast, "Dances with Robots". Topics covered ranges from Boston Dynamics robots, Tesla's "Party Mode" and Optimus robots, parasitic aesthetic theory, the movie *M3GAN*, Artificial Intelligence, and a little bit of Beyoncé.

Keywords: Interdisciplinary, free associative, caffeinated, novel, constellating

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CLOCK, FALL

Choreorobotics and
Near Futures of Choreographic Practice

© Sydney Skybetter

CLOCK, FALL

© Sydney Skybetter

Orientation

Greetings nerds.

My name is Sydney Skybetter. I'm a choreographer and the Deputy Dean of the College at Brown University.



SKYBETTER.ORG/CLOCKFALL

© Sydney Skybetter

For everyone's collective reference, if you'd like to follow along, read my remarks after the fact or view these videos again, check out skybetter.org/clockfall.

<Excerpt of *M3GAN* dancing menacingly from [here](#)>

"M3GAN (2022) – M3GAN Dances Scene | Movieclips" © Movieclips

In 2022 a film came out called *M three GAN*, about an artificially intelligent robot, who predictably loses her marbles and goes on a homicidal rampage. In one narratively inexplicable scene, she does this gymnastic, vaguely lascivious dance before murdering a dude with a paper cutter. This filmic moment—like the garbage compactor scene in *Star Wars*, like Jack's death in *Titanic*—is simultaneously

iconic and nonsensical. It just doesn't make any goddamned sense. But that didn't stop it from burning brightly across the zeitgeist.

<video montage of M3GAN dances based on [this](#) and [this](#)>

"Death doing the dance from M3gan (yes this is actually made by Dreamworks animators)" © BigCballer

"8 M3GANs dance at the Halftime show of the Rams v Chargers Game" © Movies with Epicz

People rified on *M three GAN* dances for months. They made appearances at NFL games. It took over TikTok. The self-serious goofitude of a murderous dancing robot was, for a gleaming moment, everywhere.

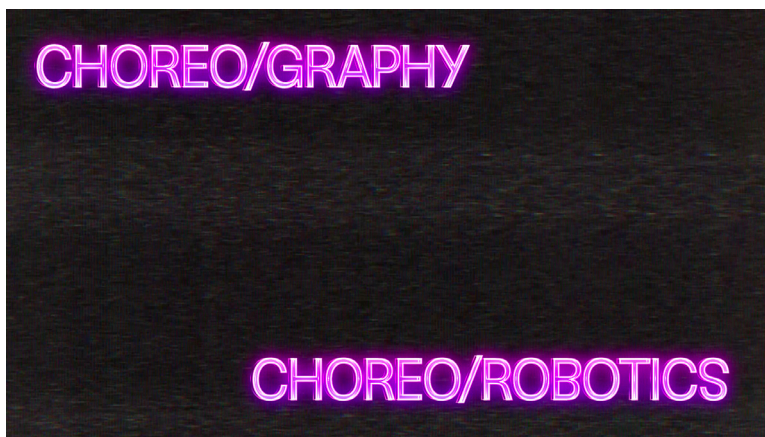
Upon viewing this, you can perhaps imagine hundreds of journalists across the country all simultaneously, each one desperately, trying to make sense of the cultural logic of this, and then, all, simultaneously googling "dancing robot murder expert", and being pleasantly surprised to learn that, in fact, there *is* an expert in dancing robot murder, and he's a professor at Brown, because of *course*, he's a professor at Brown.

True story. And around this time two years ago, I started getting emails. And phone calls. And sometimes, news crews just kinda showing up at my office.



© WJAR

This is the image that NBC used to represent me as a credible source on the subject of my life's work and research specialty. This slide shows me being interviewed wearing a lavender sweatshirt exquisitely paired with a matching face of incredulity, as I lacked media training and did not understand what was happening. The chyron names me as "Sydney Skybetter, Deputy Dean of Brown University's College for Curriculum", which is not a thing.



© Sydney Skybetter

Now, thankfully, you should know that the part of my brain that enables the capacity to feel embarrassment or shame burned off years ago as a result of a lifetime of being a professional artist.

As such, I'm here today to talk about choreorobotics, which, of course, is a portmanteau of choreography and robotics. To be an etymology ass clown for a minute, the word "choreography" is a contraction of a Greek root, khorea, as in chorus, meaning all together dancing, and an English suffix, graphy, meaning to write or *encode*. The word robot, meanwhile, is derived from the Czech, robota, meaning forced labor, or *slave*, and so the sub-field of choreorobotics is definitionally concerned with how bodies move and are encoded, and how performances *interface* with power.

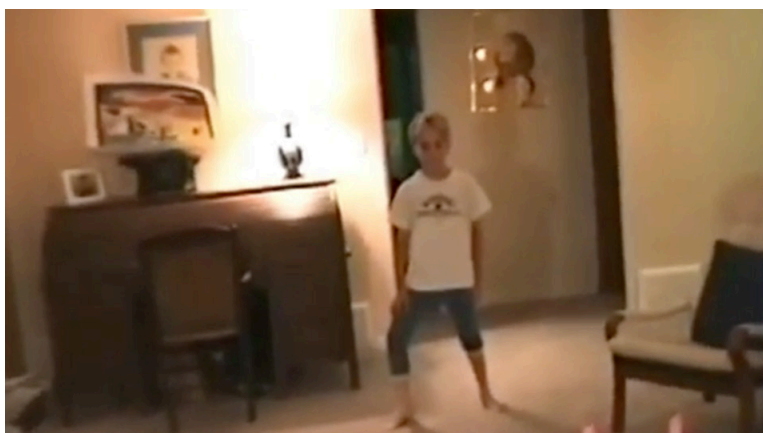
So dancing murder robots, basically, is my field of research. Choreorobotics is, I recently promised my tenure committee, totally 100%

definitely a thing. <wink> It is also totally 100% definitely a word that a gaggle of us very recently made up. If nothing else, choreo-robotics as an interdisciplinary intervention at the intersection of choreographic theory and robotic motion planning, offers a rich, critical aperture to consider how bodies in motion—human or otherwise—move through space and time to generate meaning.



© Sydney Skybetter

I've been obsessed with bodies, choreography, robots and violence for a long time.



<https://www.youtube.com/watch?v=Nr3RakYzidg> © Sydney Skybetter

This is the earliest known video of my dancing. I'm approximately ten years old, and this is the living room of the house that my family rented on a clover farm some 30 rural minutes away from Fort Wayne, Indiana. I seem to be wearing jeggings rolled up in the style of capris, have what appears to be a black eye, and tote a hairstyle very much in the shape of the bowl used to cut it. I'm dancing to my favorite musical at the time, *A Chorus Line*, and seem to be improvising with the repetitive deployment of my favorite moves from the Tumblebus dance classes I would have been taking around then.

I largely grew up in the Midwest at a moment when being a boy who danced was a positionally risky thing. My nascent engagement with ballet was read as queer, and neither my smallness nor meekness allayed the resulting violence. I was bullied a lot, called expletives from passing cars, shoved into lockers and punched in the back of the head at football games. My intention in airing this bit of trauma is to observe how dance and violence have always been linked in my embodied experience. This makes sense too from a dance historical perspective. The Western dance tradition arguably started in colonial French courts, and ballet, as historian Jennifer Homans puts it, was, for most of the 18th century, an "adjunct martial art", used tactically to augment courtiers' training in fencing and equestrianism.

Ballet and violence have mutually constituted one another for centuries.

<image of Louis XIV as Apollo ala [this](#)>

© Web Gallery of Art

Louis XIV, the arguable originator of the balletic form, used both dance and emerging technologies of dance notation as an explicitly colonial form of cultural propaganda, which

<image of [Napoleon Bonaparte](#)>

© Wallpapers Wide

Napoleon perfected by taking ballet dancers on conquests to North Africa, which

<slide of *The Nutcracker* ala [this](#) (first image)>

© Paul Kolnik

in turn shaped the plot of the original Nutcracker, *which* is an allegory of Napoleonic alliances, violence, and dance styles *which* became the most popular ballet of all time *and*, not coincidentally, tells the story of a machine that comes alive to dance and do murder.

Nailed it. <self high five>

In this fashion, my work today on dancing murder robots is simply a logical extension of the deep dance historical weirdness that came before; weirdness which provides useful vantage to understand contemporary media like <next slide> this.

Tesla

<Selected media of Tesla cakewalk [dance footage](#)>

"Elon Musk unveils plan for 'Tesla Bot' with man dancing in a bodysuit" © Guardian News

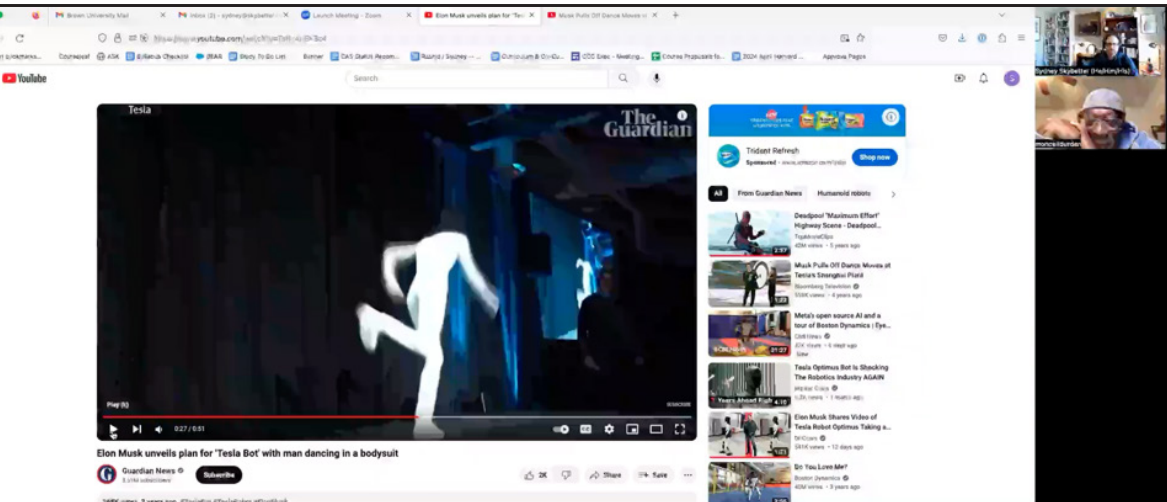
About two years ago, Elon Musk took the stage at the Tesla AI conference to announce recent progress from their "Optimus" bipedal robotics program. After introductory remarks, Musk brought on stage a dancer, dressed like a robo-minion from the then-recent film, *The Mitchells Versus the Machines*. Bear in mind, *The Mitchells Versus the Machines* is literally a satire of Elon Musk.

This human-acting-like-a-robot enters the space as a robot stereotypically might, with stiff limbs reminiscent of Daft Punk music videos. But then, out of nowhere, the dancer-slash-robot performs a series of movements originating specifically from the Black performance tradition.

I wanted to make sure I wasn't misreading what was happening here, so I called up Professor Moncell Durden at USC—he's an ethnochoreologist and expert in African American dance history. We watched the video together a few times.

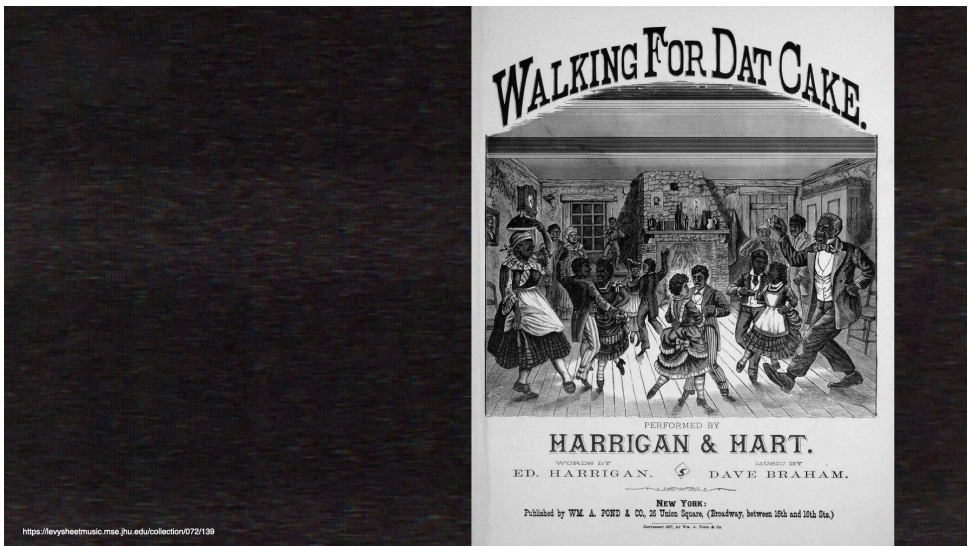
<Selected media of [Moncell and I on zoom](#), low sound, starting as he and I watch the cakewalk dance>

© Sydney Skybetter



© Sydney Skybetter

He confirmed that there's some Charleston, some shaggy jazz with Broadway inflections, some two-stepping, and most saliently, a cakewalk.



© The Lester S. Levy Sheet Music Collection

The cakewalk, as black feminist dance theorist Brenda Dixon Gottschild might remind us, is a minstrel dance that originates in the 19th century within Black and enslaved communities that literally satirizes white antebellum ball culture. There are stories from the pre-civil war south of enslaved folx competing to perform the most exaggerated, effete prances, often with plantation owners serving as judges. These stylized, silly walks were so popular that white folx incorporated them into minstrel acts and antebellum socials, performing movements they thought were the epitome of blackness, but that Black folx had created as a carnivalesque mockery of white power.

<Selected media of Tesla cakewalk [dance footage](#)>

"Elon Musk unveils plan for 'Tesla Bot' with man dancing in a bodysuit" © Guardian News

After a minute, Musk seems to get bored, or irritated and shoos the dancer off stage.

<Media from [Tesla AI day showing Musk talking](#), with the heart hands shirt, muted>

"Tesla AI Day 2022" © Tesla

He then goes on to talk about how we—his presumed audience of technocratic elites—don't need to worry about robot uprisings because his robots are gonna be friendly. Musk promises that by dint of our superior strength, speed and *intelligence*, we will always be able to overpower any robot rebellion. Recall here, again, that the root of the word, robot, is "slave".

This is an example of what the kids call a "self-own", and an object lesson in what theorist and co-curator of this series, Christopher Grobe, calls "bot face"; roughly, the use of robotic performance to reify and extend the violent appropriation of blackness into emergent technological domains using the racist logic of blackface.

<media of Musk dancing, ala [here](#)>

"Elon Musk shows off bizarre dance moves at Tesla event in China" © Global News

All of this should be placed within a more general performance context, namely, that Elon Musk is a troll. I mean that *personally*, in

that he is an amply documented sexual predator with a fondness for anti-semitism and conspiracy theories about white genocide. But also, I mean that *characterologically*, as a means to understand his personal, fiduciary, and performative priorities. As a troll, he proudly and deliberately orchestrates his sizable online presence towards controversy.

<image of [CTO twitter bio](#)>

© Sydney Skybetter

Earlier this year, Musk on-the-nose-ed-ly changed his official Twitter bio to “CTO”, or Chief Troll Officer, a role suitable for the owner of a platform that monetizes hate speech.

<Selected Media of Tesla cakewalk [dance footage](#), slightly more slowed>

“Elon Musk unveils plan for ‘Tesla Bot’ with man dancing in a bodysuit” © Guardian News

Trolling and minstrelsy are mutually reinforcing performative stanchions. This dysregulated, flukish dancing makes for weird Internet news and modulated meanings across differentiated audiences. To tech journalists, it’s a goofy joke aimed at a Tesla competitor, Boston Dynamics. To Musk’s red piller fan base, it’s a comment about “us” being smarter and more capable than robots, and the robots, to be clear, are coded as Black. To those who’d criticize overt racism in Silicon Valley, well, where are you going to post your little comments if not on Twitter? Any controversy, agreement, *or* disagreement draws attention to Tesla and enriches Musk personally. It’s a tidy ouroboros of swampy surveillance capitalism; a performance where critics enrich and sustain the very thing they resist.

And yet. Because trolling is such a haphazard, hasty pudding of a critical stance, this shaggy performance maintains unlikely traces of resistance. The dance is so derivative that its ideological and aesthetic dark matter remains present; material that *might* have been cloaked in a more thoughtful presentation; racial anxieties writing citational checks that Musk can’t cash. Within this overtly racist performance are, nonetheless, stories of resisting anti-blackness that came before. It suggests that some bodies in dissent have a longer half-life than might be pessimistically presupposed. That

somebody performed a cakewalk at a party thrown by Elon Musk could be read as trolling the *Wehrmacht Erbkönig*. So while Musk remains the richest man in the world, or whatever, dancing just a few feet from him is a black-coded robot throwing ancestral shade.

<edited footage of Optimus walking by Cybertrucks, edited with footage of Musk talking with heart t-shirt from [here](#)>

"Tesla AI Day 2022" © Tesla

At the following year's Tesla AI conference, Musk showed off heavily edited footage of "Optimus" walking constipatedly around, while narrating how its operating system is a transferable AI; an intelligence that can be relocated from robotic body to body, agnostic as to whether that embodiment is a bipedal robot or car or truck or otherwise. This suggests AIs will access different expressive registers depending on what form of embodiment they occupy. If robots are an expressive articulation of artificial intelligences, which, themselves, are algorithmic manifestations of the biases of their designers and training data, then, the racist hierarchies of AI-powered robots can be observed through their movement, dance, and *gesture*.

<zoom in on Musk heart image from video, [here](#)>

"Tesla AI Day 2022" © Tesla

Consider then, what it means for Elon Musk,

<zoom in on Musk heart image from video, [here](#)>

"Tesla AI Day 2022" © Tesla

a man with the moral character and aesthetic complexity of a Gordita crunch wrap,

<zoom in on Musk heart image from video, [here](#)>

"Tesla AI Day 2022" © Tesla

to talk about the future of labor while wearing an illustration of two robot hands forming a heart.

Musk's obsession with robots, dance and misogyny has been noted by all manner of internet cretins and resulted in some deeply weird, dancierly rat holes.

<image of Musk dancing with a robot>

Here's an AI-generated image of Musk with a femmefbot apparently named Catnilla as posted by internet person Daniel Marven, who kicked off a true world-class archipelago of incel expressivity and fervid fantasizing that Musk was secretly designing the perfect dancing robot wife.

<[other images of Musk dancing with a robot](#)>

© RedanceMe

This was, in fact, very much not a thing, and had to be debunked again and again on Reddit, Business Insider, and a bunch of other platforms by pointing to the original illustrator-slash-prompt engineer-slash—this is true—dance teacher, Diana Stark.

I read this Pygmalionic internet faff to understand how embodied AIs relate to audience reception, performance and power.

<image of [cybertruck](#)>

© Tesla

Hold on to your butts. Tesla, of course, recently released the Cybertruck, a militarized refrigerator on wheels that looks like it was designed by someone who did just a ton of cocaine and then tried—and failed—to draw a rectangle from memory. The Cybertruck, like other late Tesla models, ships with functionality called “dance mode”, or “party mode”, a bit of software that enables users to choreograph to music their vehicle’s lights and the movement of windows, fuel cap, mirrors, trunks and frunks (as in, front trunk, it’s a thing).

A bit of a re-frame is useful here. Musk says that Tesla is one of the largest manufacturers of robots on the planet because, he argues, Tesla cars are robots. This is like, the one thing that Elon Musk and I agree on; that robots are computational systems with sensory apparatuses no matter the form factor. It’s an important semantic frame that suggests choreorobotic performances need be situated neither in human nor humanoid embodiment.

<media of [cyber truck holiday light show](#)>

“Cybertruck Light Show” © Tesla

I'm trying to understand why Tesla encourages owners to daisy chain their vehicles together to perform car de ballets such as this one. There have been hundreds of these performances, and Tesla has actually commissioned some of them. The most famous are choreographed by a guy whose internet handle is HVPad, who was engaged by Tesla last Christmas to create this quasi holiday-themed sensory blitzkrieg.

Observe, these five crimson Cybertrucks facing the camera, dramatically framed by a series of Tron red trusses bisected by perpendicular fluorescents. The front of each truck is bound by two horizontal strips of light, the top extending a beam from truck left to truck right. These LEDs are capable of smooth variance and the appearance of flowing illumination. This pentagony of Cybertrucks creates a rippling visual field staged to fill the entirety of the parking lot that contains them and demonstrates a capacity to synchronize piercing lights to tacky, self-serious music. The vibe serves policing realness, the trucks composing a phalanx of armor and penetratingly asymmetric visuality that brings to mind copaganda such as

<image of [KITT](#)>

© Ivonkingsley

Knight Rider and

<image of [robocop](#)>

© Flixster

Robocop, but without those franchises' irony and campy self-awareness; an aesthetic perhaps best described as "Stand Your Ground laws meets musical theater summer camp". In this aesthetic vein, it's perhaps not surprising that Tesla maintains active contracts with police forces around the world, ranging from

<image of [Mexican cybertruck](#)>

© infodefensa.com

Ciudad Valles to

<image of [Dubai cybertruck](#) (first image)>

© Dubai Police

Dubai, and that before the Cybertruck was even released to the public,

<image of [Oracle police cybertruck](#)>

© Motortrend

Oracle, which does police stuff apparently, was already planning on manufacturing a version with extra-aggressive Tron styling for cops.

Teslas aren't just for policing though, of course. Their dance functionality indicates that they're also, you know, for kids.

When Disney's *Encanto* was released in 2021, it inspired a series of home-brew, garage-staged performances.

<[video of Tesla dancing to Surface Pressure](#)>

"Encanto - Surface Pressure // Tesla Custom Light Show For Kids!" © HVPad

This is my personal, illustrative favorite, "Surface Pressure", also choreographed by HVPad. Observe the deployment of theatrical lighting and a cornerstone of the contemporary dance trade, the smoke machine.

This particular performance is conventional of the Tesla medium: there are musically coordinated movements of the fuel cap, mirrors, and side windows. Sometimes the trunk and frunk get into it. The light show *is* the primary attentional draw, but the presence, movement and/ or stillness of car components form the robotic embodiment through which a musical visualization is staged.

Reading car parts through dance theory has limits. One of the dominant theorizations of how choreographies create meaning is through mirror neuronal meta kinaesthetic empathy. It goes something like this. I, someone with ballet training, go to a ballet show. I see a dancer perform a movement I recognize, let's say, a *fouette*.

<cropped gif demonstrating [fouette](#)>

© Center Stage

Now I've done lots of *fouettes*. They looked exactly like this. I have a visceral sensory memory of what my body feels while spinning. When I see someone else *fouette*, the mirror neurons in my brain fire

as though I'm the one doing it. I sense, in someone else's movements, my own embodied history. The dancier architecture of my aesthetic sensibilities—what I find meaningful—is preconditioned on embodied experience *and* the ability to empathically project onto others.

<media of [Tesla light show for kids](#)>

"Encanto - Surface Pressure // Tesla Custom Light Show For Kids!" © HVpad

Kinaesthetic empathy usefully demonstrates the sheer disjuncture of meaning-making potential between a human body in performance and the robotic enclosure of an AI, such as this Tesla. I cannot empathize with a window closing or frunk opening. The Tesla body is too unlike mine to be interesting for long, which perhaps explains why choreorobotic artists like

<media of [Catie Cuan](#)>

"In Her Prime - Full Performance - Smithsonian Arts & Industries Building - Catie Cuan FUTURES" © Catie Cuan

Catie Cuan,

<media of [Huang Yi](#)>

"HUANG YI & KUKA - A DUET OF HUMAN AND ROBOT" © Huang Yi Studio + 黄翊工作室

and Huang Yi, and

<media of [Merritt Moore](#)>

"Merritt + Robot Dance" © Merritt Moore | Robots & Dance

Merritt Moore, and

<media of [Beyoncé](#)>

"Beyoncé - Cozy Renaissance World Tour Kansas City, Missouri October 1, 2023" © Maverick

Beyoncé, perform their dances *with* robots to accommodate an audience's nominal interest in a robot by itself.

<media of Cybertruck dancing, about 1 minute into [this](#) to include windows and frunks>

"Electro Moves: Cybertruck Dance Spectacular" © Cybertruck To Rent

The limited applicability of kinaesthetic empathy also explains why so many of these performances drift towards scale and spectacle. Indeed, there are regional syndicates of Tesla owners with performance proclivities, resulting in an impressively diverse gamut of kitsch and a burgeoning global proto-fascist choreorobotic aesthetic.

<video of [bring me home](#)>

“israel the big tesla light show עפומ תולסט תורואה עפומ
לש סרורחש 137 © Tesla-IL”

Consider this performance produced a few months ago by an Israeli Tesla accessory store that brought together a world record-breaking 700 Teslas to, in their words, “shout the cry of the kidnapped men and women in the captivity of Hamas”.

This is one of many such performances. The mass spectacle-ization of choreorobotics brings to mind the movement choirs of Leni Riefenstahl and Albert Speer’s *Lichtdom*. The use of a luxury car as a robotic performance apparatus also illustrates some of the ideological limitations of the form. It’s hard to imagine Tesla dances for progressive causes. Assuming each of these 700 Teslas is worth an average of \$25,000 per—and I think that a low estimate—the baseline production cost for this bit of colonial propaganda starts at approximately \$17,500,000. I have been unable to locate any Tesla performances that, for example, support more, progressive, causes.

So, sure, cars have always been marketed and sold to extend their owners’ sense of identity. We have been trained under capitalism to understand our vehicles as an extension of ourselves; a cyborgian, performative proboscis that Musk’s Teslas take to an extreme by shipping cars with end-user choreorobotic performance software.

<Media / documentation scroll from GitHub, [here](#)>

© GitHub

This is documentation of Tesla’s dance functionality from GitHub. With a little Python you can create a script that will sync your lights and the opening and closing of your falcon doors to any piece of music you upload to your car on a thumb drive.

There’s also a rudimentary interface that shows the waveform of the dance track, with sliders and checkboxes indicating what parts of



Choreorobotics

Interface Analysis

Dance Studies

© Sydney Skybetter

the car you want to move, in what sequence and for what duration. It's a little like Garageband, but for car dancing.

One of the facets of my research at Brown is Choreographic Interfaces; the computational means for emergent choreographic production. I think about how software enables dances to be made, whether those dances are embodied by people or machines, because in this context, the design of the software determines what gets to be called a dance, and what the component repertoires, grammars and declensions of that dance can even be. This is where interface analysis and dance studies get cozy;

when we consider, echoing performance theorist Joseph Roach, that aesthetics and interfaces are ideological formations that contend simultaneously with what an observer already understands about culture, and what a designer aims to communicate about power.

<Image of police [cybertruck](#)>

© Daivatd

Tesla's vehicular razzle dazzle points to a predominant choreorobotic norm; that the platforms deployable for performance exist coterminously with misogynistic tech bro goblin culture, as well as numerous flavors of anti-black and anti-brown violence. Indeed, much choreorobotic creative production can be keenly framed in the context of military dual use. Consider: the inevitable deployment of the cybertruck's lights to alert or disorient onlookers by police forces.

And then those same lights are being used to musically visualize your favorite song by Coldplay.

<[Video of cybertruck Coldplay song](#)>

"1st Custom Cybertruck Light Show - Coldplay - A Sky Full of Stars (Revised)"

© Vegas Tesla LightShows

Theoretical Framing

I am drawn to the gnarliest braids of emergent choreographic phenomena because I want to understand how dance history's violent entanglements perpetuate themselves. And thus, how that perpetuation can be resisted and reversed. The means of dancerly production at play, in choreorobotics especially, are bonkerballsly expensive, and concentrated within corporate, academic, and military facilities requiring specialized networks and institutional privileges as a precondition for access.

<image of the book [The Play in the System](#)>

© Amazon

The text that helped me understand this matrix of relations is <cough cough Brown graduate> Anna Watkins Fisher's *The Play in the System: The Art of Parasitical Resistance*. Fisher argues that surveillance capitalism is so advanced, proliferated and ubiquitous, that we are *all* implicated. There is no *outside* of it. There is no turning it off. To greater or lesser extents, we're all already jacked into the machine, and resistance is inevitably co-opted, to its benefit, by the borg.

“The Aesthetic Theory Part”

© Sydney Skybetter

PARA/SITOS

© Sydney Skybetter

Fisher points out that the word, “parasite” comes from the Greek, *para* (meaning alongside) and *sitos* (meaning food, or a meal). She examines the commedia dell’arte character of the parasite; how it cozies up to power with *flattery*, wielding the resultant proximity for its own ends: usually, like, food, but more broadly the parasite’s own continuation. In classical context, the parasite has specialized knowledge—usually of a religious, moral, or *artistic* sort—that makes it somehow useful or interesting to a host. The parasite is, however, definitionally precarious, forever a guest in someone else’s house; always on the brink of being asked to leave; forced to maintain a delicate balance of extraction and siphoning while playing the part of esteemed, compliant guest.

The host, despite their performance of hospitality, has limits. The parasite gets away with as much as possible, but never more, because if the host begins to question the arrangement, the parasite’s access will be cut off, and parasites can’t *live* without a host system. The stakes for being found out are total. Parasitism then, as a mode of resistance to corporate capitalism specifically or hegemonic power broadly, is always politically ambivalent, delicately situated, necessarily subtle, and always already incomplete, in that, in the *long* term, resistance inevitably benefits the host.

But in the *short* term, there’s a bit of slack. Reaction time is a factor. Until the host responds by reflexively shutting down and expelling the parasite, there’s a tiny window for play.

Simultaneously siphoning while sustaining the host system necessitates the parasite’s artful management of *implications* across performative, spatial, and chronological dimensions; a dance of willful misappropriation across space and time. Who is most successful at this play of surfaces? In Fisher’s view: *artists*, who arguably have the most latitude to wield their implications to creative effect. After all, the history of the Western performance tradition—dance especially—is a history of doing whatever it takes to keep the lights on.

Boston Dynamics

<Dance media from [Uptown Spot](#)>

“UpTown Spot” © Boston Dynamics

I began studying choreorobotic performance in earnest in 2018, when Boston Dynamics released “Uptown Spot”; a music video of their quadrupedal dog robot, “Spot”, grooving to a cover of Bruno Mars’ and Mark Ronson’s *Uptown Funk*. Today, Boston Dynamics is one of the most advanced robotics companies on the planet; think Cyberdyne Systems but based in Waltham, Massachusetts and owned by a Korean conglomerate, Hyundai. The company was founded in 1992 when Marc Raibert—then a professor at MIT’s Media Lab and founder of the Leg Lab, true story—spun off his grants from the Department of Defense to hang out his own shingle: Boston Dynamics. By the time he released “Uptown Spot”, some 25 years later, I understood the company to be a military robotics contractor in the tradition of *Terminators* one through six and *Ghosts in the Shells* one through eight. As such, I had no reason to *expect* that the company would produce *music videos* featuring AI-powered robots bibbidi bobbidi booping through a potpourri of dance techniques sourced from the Black dance vernacular.

In “Uptown Spot” we observe a quadruped twerking, doing the running man and two-step, all performed with rhythmic precision to a track sung by a man of color written by a white British dude about selling cocaine in *Harlem*.

<Media of gifs with surrounding technical context from [API](#)>

© Boston Dynamics

I want to note that these aren’t just appropriative choreographic choices manifested exclusively at the level of YouTube performance. These dance techniques have been lifted out of cultural context and encoded at the level of software and *interface*. The twerk, for example, is an Africanist and African American movement technique that temporarily gained prominence in New Orleans in the 90s and has since been a staple of hip hop and femme Black dance performance. The choreographic interface governing Spot’s motion planning defines a “twerk” as a motion which “Lowers the robutt down [pause for laughter] and back up once”. An end user can select how much to lower the robutt, but according to the interface, the movement can only last one beat of a 4/4 meter, and even then, only within certain tempos. The robot thus aims to perform a Black-coded movement, but without the possibility of rhythmic complexity and exclusively on a basic 4; the Miley Cyrus of time signatures.

<Slowed dance media from [Uptown Spot](#)>

"UpTown Spot" © Boston Dynamics

When this was first released, it wasn't clear if it was a joke; an elaborate ruse, orchestrated to trigger snowflakes such as myself into applying critical race theory onto a war machine apparently capable of bringing the funk. I was fascinated by this vexing performance and wanted to know more about how such a William Gibson fever dream could somehow also be real, so I sent a cold email to info at Boston Dynamics dot com, not really expecting a response, to the effect of, hi, I'm a choreographer, and you're a military robotics company, literally what are you doing? Minutes later, I got an email back from Marc Raibert, saying, quote, "we want to do more: more dancing steps, more types of robots, multiple robots dancing together, robots + people, and perhaps some big production videos.... Do you know choreographers in the Boston area who might want [to] work with us?"

"Uptown Spot" was a seemingly sudden, mega-viral success predicated on *years* of aesthetic experimentation that placed military tech in dancerly performance contexts vis-à-vis quasi-music videos. Absent that knowledge, one could watch this without discerning it was the outdraft of millions of defense dollars and conservative ideological posturing. The prior art, however, is significantly less subtle.

<video from [big dog reflexes](#)>

"BigDog Reflexes" © Boston Dynamics

In 2009 Boston Dynamics released a YouTube video called "BigDog reflexes", featuring their DARPA funded, couples Halloween costume-looking, Spot-antecedent getting kicked around a parking lot. The sound is intermittently and theatrically slowed and distorted, with ironic, floral top notes of 80s horror VHS tapes,

<video from [big dog reflexes](#) featuring slowed down noise section>

"BigDog Reflexes" © Boston Dynamics

the whine of the robot's gas-powered go-kart engine distended into a Hellraiser mewl.

<remix of boston dynamics robots getting kicked and stabbed, ie

from [here](#)>

"Every time Boston Dynamics has abused a robot" © Daniel Estrada

"BigDog reflexes" kicked off, as it were, a now-established representational trope wherein the resilience of a Boston Dynamics robot is demonstrated by just really kicking the shit out of it.

<[Media of "BigDog Evolution"](#)>

"BigDog Evolution" © Boston Dynamics

Two years later, the company released a compilation video of Big Dog's progress, accompanied by a strange bauble of a blues song called, "Let the Big Dog Eat". The lyrics to this particular rendition begin with,

*Way over yonder in the middle east
They've sure got a big dog he's quite the beast
Nowhere to hide and nowhere to run
When he blows you to kingdom come*

Lots of people have recorded this song. Most of them tastefully abstain, you know, from the fervid, Orientalist fantasy of Middle Eastern violence part. This version was sung by the almost famous brother of

<image of James Taylor, i.e. [this](#)>

© Concord Records

James Taylor,

<image of Alex Taylor, i.e. [this](#) (first image)>

© Music Museum of New England

Alex Taylor, and was produced by King Snake Records, which, in the 90s was a small, independent label in Sanford, Florida. You might have heard of Sanford; it's where Trayvon Martin was murdered by George Zimmerman. In fact, King Snake Records was located just five minutes away from the scene, by car.

<image of [Jeb Bush](#)>

© Education Next

Meanwhile, the phrase “let the big dog eat” entered the popular discourse briefly when Florida Man Jeb Bush, 2010 Visiting Fellow of the Harvard Kennedy School and self dick stapler of a 2016 Republican presidential candidate, in a moment of Dukakisian flair, summed up his tax policy as “let the big dog eat”. Nobody outside Florida knew what he was talking about. He has since retired from public life.

<[Media of “BigDog Evolution”](#)>

“BigDog Evolution” © Boston Dynamics

“Let the Big Dog Eat”, sung alongside abundant representations of military accouterment ranging from camo to V-22 Ospreys, squarely situates this media within a matrix of colonial, orientaling ideologies, while evidencing audience-oriented—if still nascent—choices pertaining to musicality, sound design

<media of Big Dog with horns, [here](#)>

“BigDog Olé” © Boston Dynamics

and even costuming. I read “BigDog Evolution” as a proto-music video of sorts, and while the eponymous big dog performs less overt dancery material here than in “Uptown Spot”, the robot’s movements through space and time teem with political signposting; representational flexes that grew subtler as Boston Dynamics’ messaging matured, and they moved towards a mass market.

Between “Big Dog reflexes” and “Uptown Spot”, Boston Dynamics’ quadrupeds miniaturized, went electric, and were made semi-autonomous via AI.

<Technical image of [Spot](#)>

© Boston Dynamics

Meet, Spot. In 2019, Boston Dynamics started selling them to just about anyone with a spare \$75,000 dollars, give or take another one or two hundred Gs for sensor packages and robotic arms. The company has maintained its military contracts while leaning into the big “three Ds” of robot jobs—anything dull, dirty or dangerous. For example, Spots have been deployed at Chernobyl and Fukushima, cementing one of Boston Dynamics’ preferred narratives: Spot is tiny, agile, and artificially intelligent; it excels at sensing and surveillance, and is the perfect substitute for *people* in work contexts where you

wouldn't want to send a human.

This logic informs Spot's deployments in policing contexts, such as when cops sent them in to defuse such tense situations as,

<slide of media of [Spot near bus in Hollywood](#)>

"LAPD deploys robot dog to help with standoff in Hollywood" © KCAL News

in Hollywood, California, when an armed man refused to get off of a bus,

<slide of Houston motel spot [media](#)>

© Eyewitness News

or in Houston, Texas, where a naked, armed man dragged a Spot into a motel room. Better the robot than a police officer, or, you know, counselor, or mental health practitioner, or gun control, I guess. Cops trebucheting robots into the danger zone results in predictably racist and classist outcomes.

<media from NYPD deployment [here](#)>

© *New York Post*

In the fall of 2020, a Spot was deployed in the historically black neighborhood of Cypress Hill in Brooklyn to resolve a parking dispute.

<media from NYPD deployment, [here](#)>

© *New York Post*

In February of 2021, a Spot was deployed in the historically black neighborhood of Wakefield, in the Bronx, to investigate a home invasion, and in

<media from NYPD deployment, [here](#)>

"NYPD robot dog hits streets of Manhattan" © FOX 5 New York

April of that same year, a Spot was deployed into a public housing complex in Manhattan to investigate a domestic dispute.

The resulting citizen anger can be understood in the immediate historical context of, among other things, horrific racial disparities in COVID healthcare outcomes and the trial of Derek Chauvin for his

← Post



Alexandria Ocasio-Cortez

@AOC



Shout out to everyone who fought against community advocates who demanded these resources go to investments like school counseling instead.

Now robotic surveillance ground drones are being deployed for testing on low-income communities of color with under-resourced schools 👍



New York Post @nypost · Feb 23, 2021

Video shows NYPD's new robotic dog in action in the Bronx trib.al/nJF1yEh



2:31 PM · Feb 25, 2021

2.4K

20K

112K

708



Post your reply

Reply

murder of George Floyd amidst violent suppression and surveillance by police of Black Lives Matter protests all around the country.

The NYPD's Spot deployments became an object lesson in cops and Boston Dynamics' collaborative striving for innovation at the intersection of anti-black surveillance and class struggle.

<media from "[Do You Love Me](#)">

"Do You Love Me?" © Boston Dynamics

No matter how virtuosic their renditions of the Black social dance vernacular, no matter how well they funk'd it up, disco'd, did the twist, or the mashed potato, none of it allayed the irresolution of Boston Dynamics' robots being representationally enveloped in Blackness all while being martially deployed against Black communities.

This music video is set to the Contours' Motown classic "Do You Love Me", and begins with a Boston Dynamics "Atlas" robot pointing to the camera as though to gesture towards and implicate the viewer in response to the question posed by the lyrics, "Do you love me now that I can dance?" Titled, "Do You Love Me?", this media was released in late December of 2020, just as the NYPD deployments of Spot were hitting the mainstream press. The question, do you love me now that I can dance, reads as an admission of sorts; an ironic insecurity on the part of a military-adjacent robotics manufacturer; self-effacing tactical bot-face for the sake of PR spin.

The sheer racist face punchability of the situation was perhaps best summarized by

Representative Alexandria Ocasio Cortez: "Now robotic surveillance ground drones are being deployed for testing on low-income communities of color with under-resourced schools".

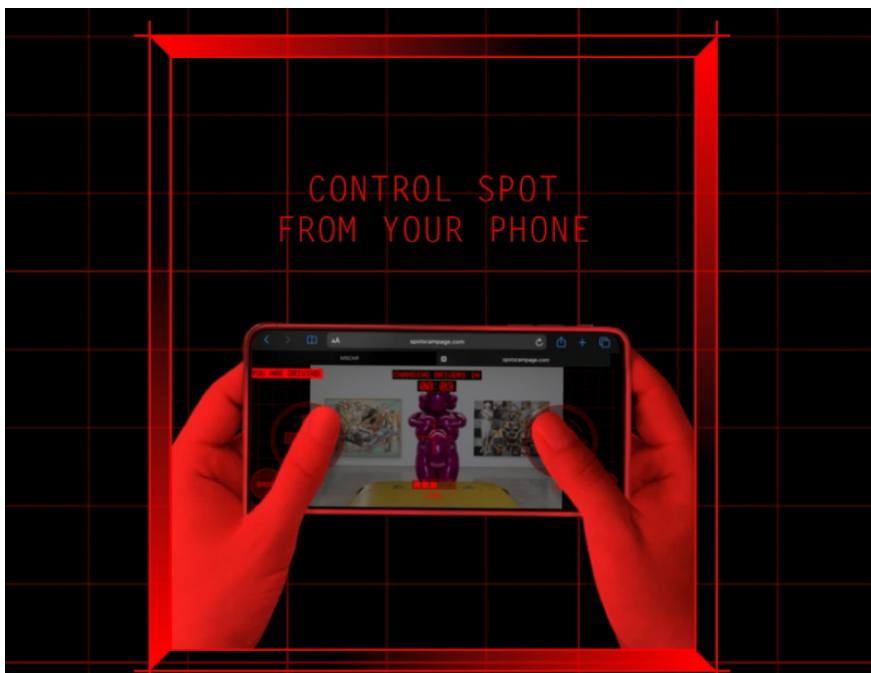
AOC's read rhymes with Simone Browne's "Dark Matters: On the Surveillance of Blackness", in its historicizing of surveillance technologies perfected in anti-black contexts from the triangle trade to the TSA. AOC also echoes Ruha Benjamin's "Race After Technology", and her pronouncement that "Black folks live in the future". As in, the future is dangerous for black folks, but the danger eventually knocks for us all.

The NYPD's Spot deployments resulted in fierce backlash from local policymakers and activist artists. At about the same time as AOC's comments, a collective founded by <cough cough> Brown / RISD graduates, MSCHF, released a virtual experience titled *Spot's Rampage*. The work featured a Spot with a 68-caliber strap-on paint gun, and gamified controls enabling random website visitors to puppet the robot at two-minute intervals. The Spot's puppeteers then proceeded to destroy a whitebox gallery space filled with representations of Warhol's Brillo Boxes and Duchamp's *Bicycle Wheel* amidst remixed brand markings of arms manufacturers, Raytheon and Lockheed Martin. Spot's installation amidst loud signifiers of ironic art history, then juxtaposed against the iconography of the American military industrial complex, accessibly situated Spot as found art of war for a popular audience.

I'm particularly interested in the choreographic interface undergirding all of this.

<https://spotsrampage.com/> © MSCHF

MSCHF DROP #40
SPOT'S RAMPAGE



© MSCHF

This software enabled a global gaggle of internet users to pilot Spot's movements and weaponry, underlining AOC's point that the robot is a ground drone—a cute tank, really—best understood as an instrument of class warfare that ultimately destroys whatever context it's placed within. *Spot's Rampage*, crucially, distributed users' *implication* in the ensuing maelstrom. Piloting Spot was *fun*; a Fortnite-ization of art history as mediated by a robot going ape shit in Brooklyn. Our collective entanglement in choreorobotic violence made, briefly, hilarious.

Until it got shut down by Boston Dynamics,

Who had—and I'm thinking of Roach here—aesthetic—as in, ideological—concerns for what gets to be art, or not, what art is allowed to do, or not, and therefore, what art should be permitted to exist, or not.

← **Post**



Boston Dynamics
@BostonDynamics



Today we learned that an art group is planning a spectacle to draw attention to a provocative use of our industrial robot, Spot[®]. To be clear, we condemn the portrayal of our technology in any way that promotes violence, harm, or intimidation. Our mission is to create and deliver surprisingly capable robots that inspire, delight & positively impact society.

We take great care to make sure our customers intend to use our robots for legal uses. We cross-check every purchase request against the U.S. Government's denied persons and entities lists, prior to authorizing a sale. In addition, all buyers must agree to our Terms and Conditions of Sale, which state that our products must be used in compliance with the law, and cannot be used to harm or intimidate people or animals. Any violation of our Terms of Sale will automatically void the product's warranty and prevent the robot from being updated, serviced, repaired or replaced.

Provocative art can help push useful dialogue about the role of technology in our daily lives. This art, however, fundamentally misrepresents Spot and how it is being used to benefit our daily lives.

7:28 PM · Feb 19, 2021

© Sydney Skybetter

“We condemn the portrayal of our technology in any way that promotes violence, harm, or intimidation... Provocative art can help push useful dialogue about the role of technology in our daily lives. This art, however, fundamentally misrepresents Spot and how it is being used to benefit our daily lives”.

It’s hard to know exactly what happened next. MSCHF claims Boston Dynamics used a backdoor to remotely brick their Spot, which is certainly possible from a technical perspective, if ultimately unprovable. Either way, with Spot apparently deactivated, Spot’s Rampage was over.



© MSCHF

Until it wasn't.

MSCHF then loaded up Spot's carapace with just giant guns, and displayed the sequel to *Spot's Rampage*, titled *Spot's Revenge*, at the Perrotin Gallery in the Gangnam district of South Korea, about a 20-minute bus ride and middle finger's distance from Hyundai's global corporate headquarters in Seoul.

The backdoor deactivation of *Spot's Rampage* demonstrates the asymmetric, blackboxed matrix of power that choreorobotic performances navigate.

Parasitism, turns out, goes both ways. *Spot's Rampage* got shut down because it pissed off Boston Dynamics, but specifically because the company maintains means of controlling its products even when they're notionally piloted by others; parasitic manipulation of a host via a previously unknown and undisclosed virtual umbilicus lurking in the hardware.

Any art deploying robotic components is subject to terms of service and use as interpreted by the manufacturer, thus requiring artists' continuing implication within and negotiation of a corporate legal framework. The withdrawal of host and manufacturer support usually means the end of the art, except *that* was surely MSCHF's tactical intention all along. *Spot's Rampage* triggered an allergenic response from Boston Dynamics that—continuing the logic of Fisher's *Play in the System*—demonstrated the conditional edges of the company's supposedly innovative culture and corporate hospitality. The friendly neighborhood transnational AI and robotics company couldn't metabolize the performance, and thus, had to expel it, inadvertently sustaining the very choreorobotic project they tried to quash. Tweeting jeremiads about the *proper* role of creativity in society while trying to kill some art made the company's hypocrisy plain.

Between lousy press coverage of the Spots in New York and pressure from the Brown University weird art community, the NYPD pulled the plug on the partnership with Boston Dynamics in April of 2021, almost exactly three years ago to the day.

<imagery from NYTimes piece [here](#)>

© *The New York Times*

The Spots were deactivated and returned to Boston Dynamics, and Spot's tenure in New York City was over.

Until it wasn't. Last year, Mayor Adams hosted a press conference in Times Square to announce that he was letting Spot "out of the pound", and that the robots would rejoin the New York Police Department's menagerie.

<Excerpt media of spot dancing at press conference ie [here](#), others>
"Crime-fighting robot dog joins NYPD" © NBC News

Throughout the demonstration, for a fawning audience of police and press, Spot danced.

The Final Frontier

<images of [Apollo](#)>

© Apptronik

One of the platforms I've begun researching from the choreorobotic perspective is "Apollo", a robot intended for eventual deployment in space missions by frequent NASA collaborator Apptronik.

<video of [Apollo dancing](#)>

© TheHumanoidHub

A few weeks ago at South by Southwest, Apollo premiered a dance derived from movement training data extracted from YouTube videos by Czech / Nigerian choreographer Yemi A.D. This choreographic method—feeding a generative system dancerly motion capture data—is, perhaps predictably, yet another means by which choreorobotic systems are compelled to appropriate and perform Blackness. That's Yemi right there, grooving, superiorly, alongside his own choreorobotic doppelganger. Apollo, by the way, is the bipedal robot most likely to be sent, by NASA, to the moon.

I've been thinking about outer space a lot lately. Choreographers, of course, are trained to think about how human movements through space and time create meaning. But not just any space and all time; terrestrial space and sublunary time. On earth, space and time

maintain a proportional relationality grounded in our kinaesthetic experience of Earth's gravity. Most of our bodies know what it feels like to roll down a hill, to sit in a theater, or to drive in a car. We hold proprioceptive sensing of these things in common. Human culture perpetuates difference, but what we share with almost absolute uniformity is the experience of being pulled downward at a rate of 9.8 meters per second per second. Our bodies, our theater, all of dance history, all creative production, the entirety of our understandings of the social and the civil are predicated on living on *this* planet as orbited by our moon, as we circle our sun. What we call culture is made possible by having physics in common.

Our conceptualization of relativity and the interstellar, meanwhile, braids space and time into spacetime. Out there, the absence of uniform gravity suggests new dimensions to the experience of embodiment and an unevenly distributed phenomenological understanding of our most basic societal premises. Out there, our bodies will exist across a brain-melting matrix of time-dilated relativities, wheres and whens, thens and theres, nows, histories *and* futurities. All of which profoundly flummox terrestrial means of creative production.

Perhaps we can imagine, cerebrally, sort of, the distances, scales and embodied phenomena required for the maintenance of life off Earth. We can do math, we have models, science is real and we have the technology. But our bodies have no lived comprehension of a void made up more of time than space, and there's a lot of space, and it's all trying to murder you. Navigating these intense spans of spacetime *requires* our bodies to be homed exclusively within suits, space stations, and shuttles. Somewhat like their simpler antecedents, cars, these media are inordinately complex computational, surveillant and *robotic* apparatuses with deep investments in human signification, embodiment, artificial intelligence, and interfaciality. Next-generation space stations are basically just giant Voltron robots pumped full of oxygen that we populate with our bodies and a mikrokosmos of the social. As such, I posit that physiological and, especially, *cultural* survival in space will be predicated on choreo-robotic theory and practice.

In a Marshall McLuhan-y sense, I'm sure we'll go through a period of skeuomorphic cultural production that leverages terrestrial creative modes as we venture into space. The dance of the future will, for

a while, probably look like the dance of the before times, just with less gravity. We will absolutely do space ballets, and space painting, and space Shakespeare, and generally plug and play creative modes from Earth into the vacuum. But, out there, normative, earth-bound performance architectures like theaters are completely implausible. The maintenance of social ties requires a common culture and shared means to make meaning. To navigate the interstellar, live in space and inhabit other planets, we have to conduct technological research encompassing cultural, aesthetic and performance inquiry. To understand what life is out there, yeah we'll need scientists, but we will also need artists, dancers, and choreographers who can ascertain the creative opportunities uniquely afforded us by space-time. Science will tell us what it is. Artists can tell you what it means.

At Brown, we're planning a microgravity choreorobotics initiative to think through the relationship of robots, performance, architecture and the void; to imagine the aesthetic, as in, ideological, frames required to consider the cultural dimensions of interstellar travel; performance phenomena governed asymmetrically as much by the physics of space as the geometry of time.

<slide of the [Aurelia Institute](#)>

© Aurelia Institute

I've also begun working with the folks at the Aurelia Institute, whose mission is to prepare humanity to become a spacefaring species. The Conference for Research on Choreographic Interfaces and our podcast "Dances with Robots" is planning an entire season dedicated to figuring out what it takes to send dancers into parabolic flights to conduct zero gravity performance research.

Practically speaking, this will consist of vomitously vacillating between zero and 1.8 Gs, hurdling us towards outer space at six miles above sea level and at 400 miles per hour to dance in microgravity within 22-second intervals. Figuring out how to make dances in variable gravity, six miles above sea level at 400 miles per hour within 22-second intervals is the most immediate next step in our choreorobotic research.

Along with Aurelia, I've begun organizing teaching materials for a next generation of sky walkers to think critically about the hu-

man-robot interfaces of the future, as a precursor to considering the ideological—as in, aesthetic—prerogatives of interstellar culture. We have to understand space stations and robots like Apollo as culturally situated objects that carry the ideological priorities of their makers wherever they go—be it Texas or Mars. The risk as I see it, echoing Octavia Butler and bell hooks, is that if we aren't mindful of how hegemonic juices flow through these systems, we'll wind up with imperialist white supremacist heteropatriarchy in *space*. At a contemporary moment of great investiture by offensively rich white men in the colonization of the cosmos, this seems like something we should resist with some serious fucking fortitude.

The Silicon Valley move-fast-and-break-things ethos can make this all feel like a very *now* kind of thing, but there are useful torsades of history that hold choreography, robots and space travel together. Consider, Apollo.

<slide of [Apollo](#)>

© Apptronik

Naming this robot, Apollo, gestures simultaneously towards aeronautic and dancery lineages. Most prominent, of course, is the nod to

<slide of [Apollo program emblem](#)>

© Wikipedia

NASA's Apollo program, named for the

<slide of [Apollo the god](#)>

© Wikipedia

Greek god of the Sun *and* of the dance. Apollo too plays prominently in Western performance, for being the *nom de guerre* of the arguable originator of the balletic tradition itself, wait for it,

<slide of [Louis XIV as Apollo](#)>

© Web Gallery of Art

Louis XIV, le Roi Soleil. He would deploy

<Later [image of Louis XIV](#)>

© ART-PRINTS-ON-DEMAND.COM

Apollonian symbology as his personal emblem and propagandistic icon of the French empire as long as he lived. And even beyond.

<image of [Cannons](#)>

© Wikipedia

The French military emblazoned the symbolic set on their canons for most of the 18th century, concretizing Apollo's importance for both pirouettes and parabolic projectile warfare.

<Image of globe balloon, [here](#)>

© Wikipedia

The origins of space travel navigate nearly *identical* striations of power. One of the first attempts at escaping gravity dates back to 1783, when the Comte Antoine de Rivarol proposed to the Louis XIV-founded Royal Academy of Sciences two conjoined scientific ventures. The first, a "globe airostatique" capable of being humans' first flight. The second: a humanoid, clockwork automata, a primitive robot, with a silk larynx and leather lungs capable of uttering in French what translates sycophantically into English as, "O adored king, father of your people, their happiness shows Europe the glory of your throne".

Robotic performance and colonial imperatives go way back and meet at regular intervals over the next three or so centuries. The articulation of that history is out of scope for this particular lecture, but I broach it here as a note of caution.

<image of Atlas in [space](#)>

© Marc Theerman

The Chief Strategy Officer at Boston Dynamics, Marc Theermann, posted on LinkedIn a few weeks ago this image of Atlas robots performing tasks on what appears to be the moon in the context of a note of appreciation for Elon Musk. He says, "At Boston Dynamics, we have explored the possibility of robots playing a role in space exploration... I believe that our humanoid robots could be a valuable asset in the coming *centuries*".

Elon Musk, meanwhile, founded SpaceX to literally colonize Mars. So, there's that.

All of these projects are, on differing scales, ideological projections that extend robotic embodiments and hunger for capital and territory across time and *into* space.

Consider then, Apollo, <[video of Apollo dancing](#)>

© TheHumanoidHub

a robot laden with history, setting the stage for a next generation of human robot interaction, and a likely kernel of space culture to come. Consider the clumsy processual mimicry of an artificially-intelligent robot imitating the movements of its black progenitor. Consider this ineffectual denouement of a choreorobotic performance; a dance about the future of labor that devolves into glitched asymmetry as Apollo's two robot hands attempt, and fail, to form the shape, of a heart.

<ENDING>

Thank you.

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